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(71) Applicant
Fairbairn Lawson
Packaging Limited,
Wellington Engineering
Works, Leeds, in the
County of York

(72) Inventor
David John Pye

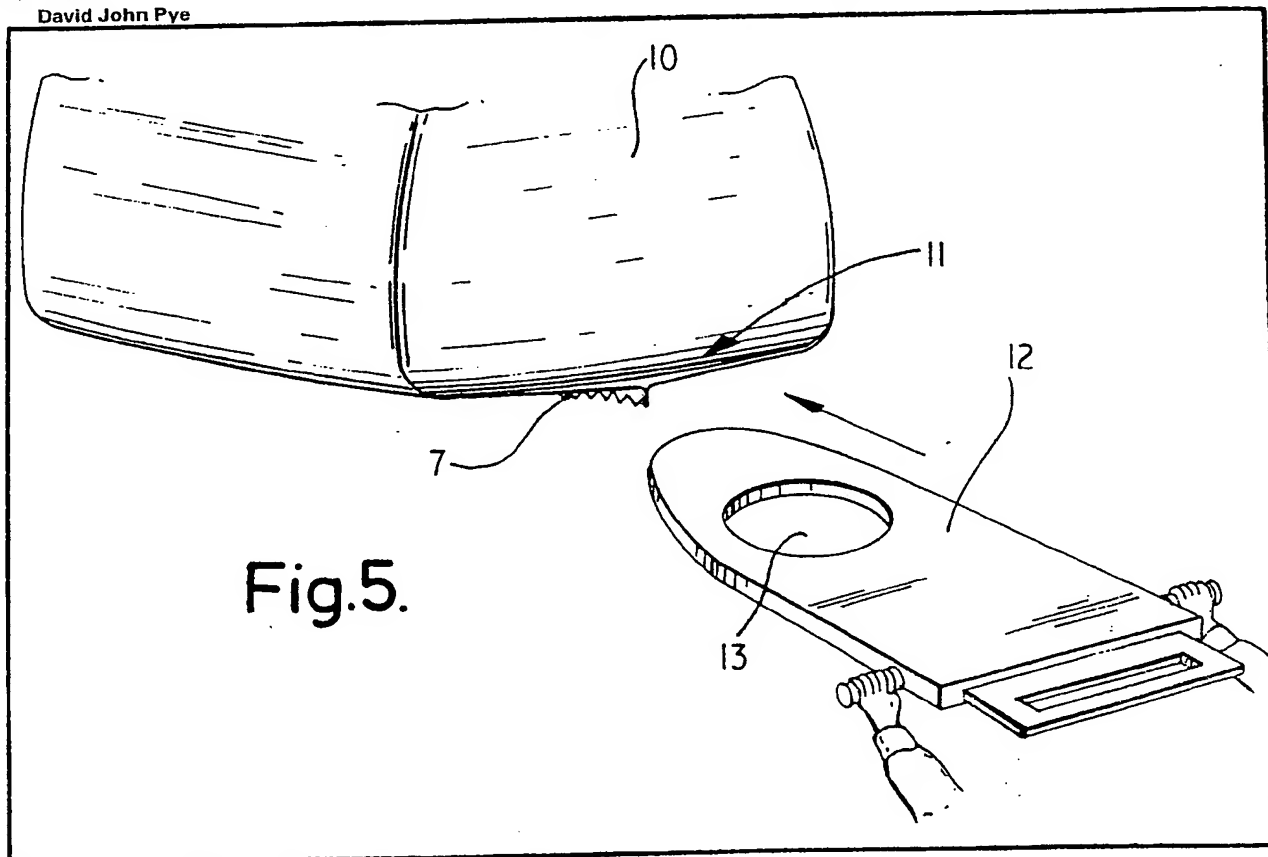
(74) Agent
Appleyard, Lees & Co.

(54) Discharging Container
Contents

(57) To discharge fluent materials
from a flexible bulk container 10 a

spade 12 is located in a "pocket" in
the base of the container so that it
becomes suspended from the
container. The spade has an aperture
13 and a slidable shutter for opening
and closing the aperture. The base of
the container is slit through the
aperture to provide an outlet capable
of being regulated by the shutter.

The drawings originally filed were
informal and the print here
reproduced is taken from a later
filed formal copy.



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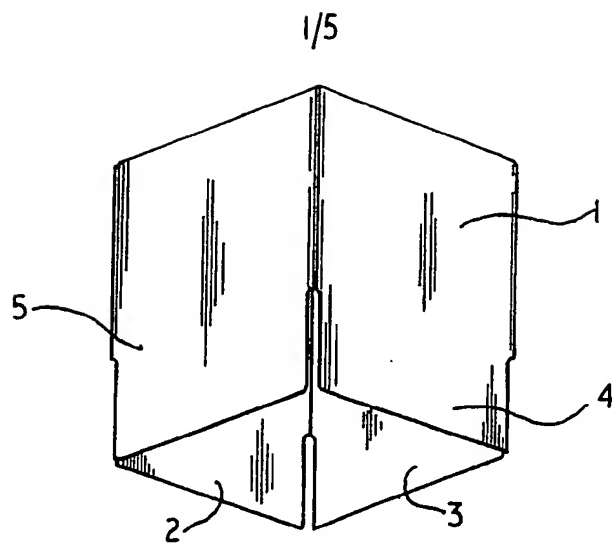


Fig.1.

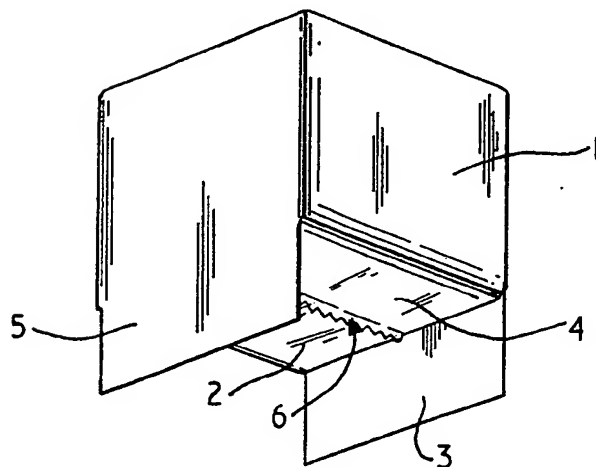


Fig.2.

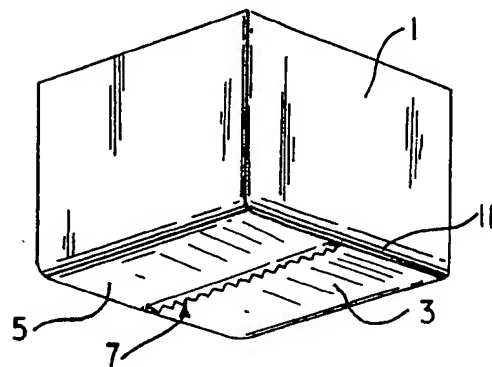


Fig.3.

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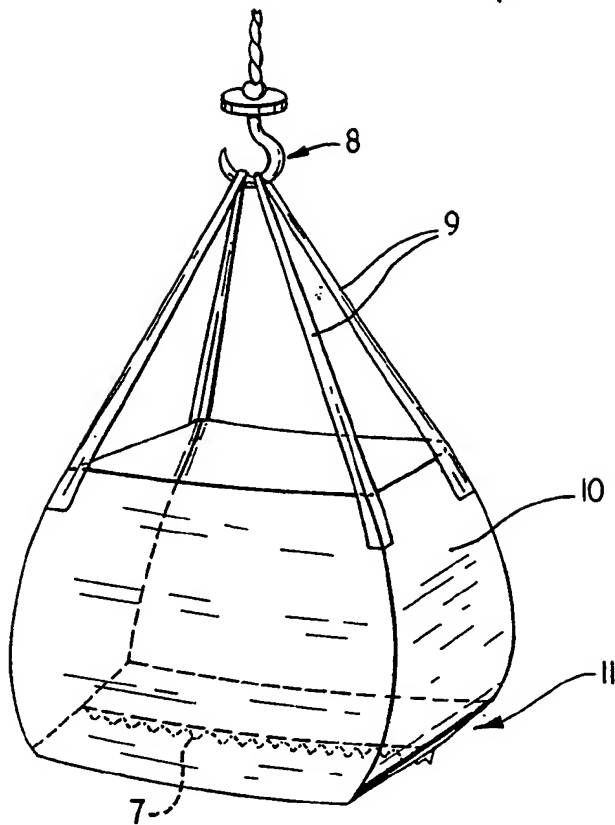


Fig. 4.

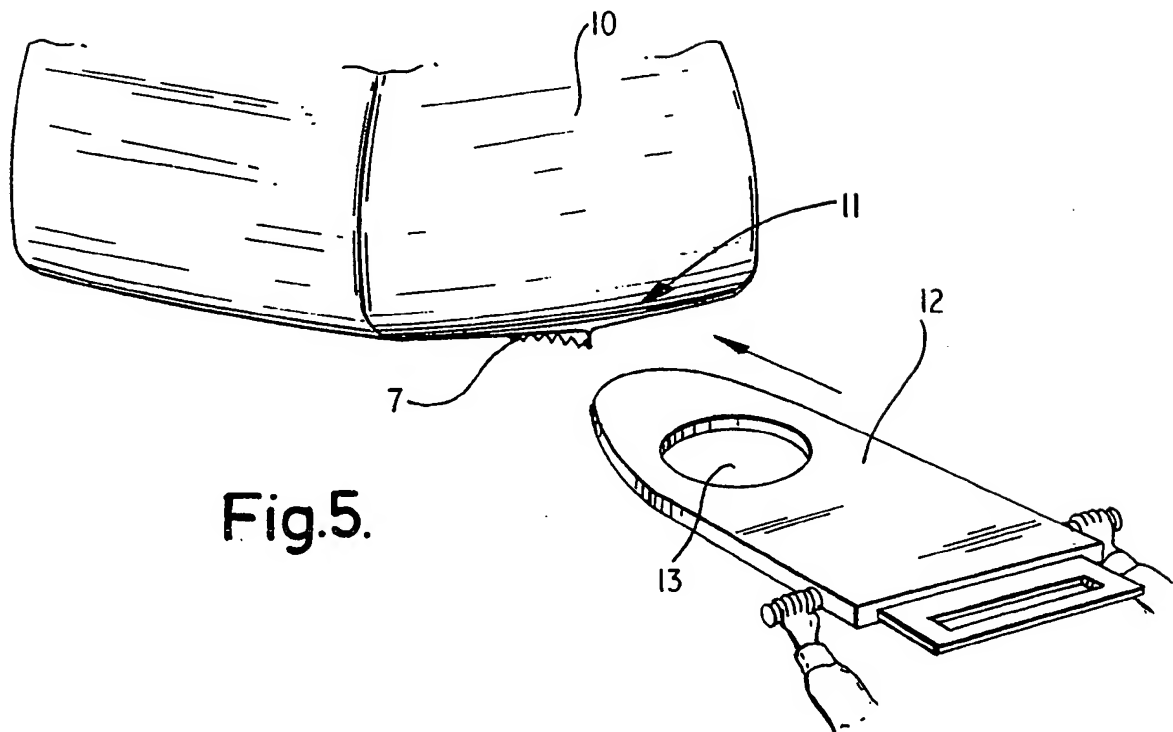


Fig. 5.

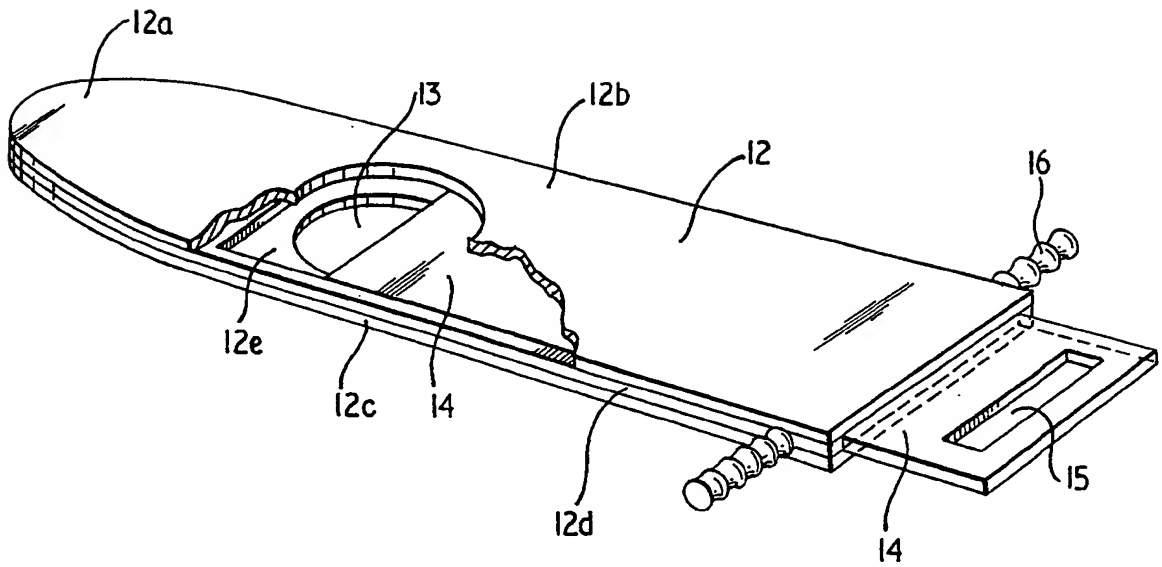


Fig.6.

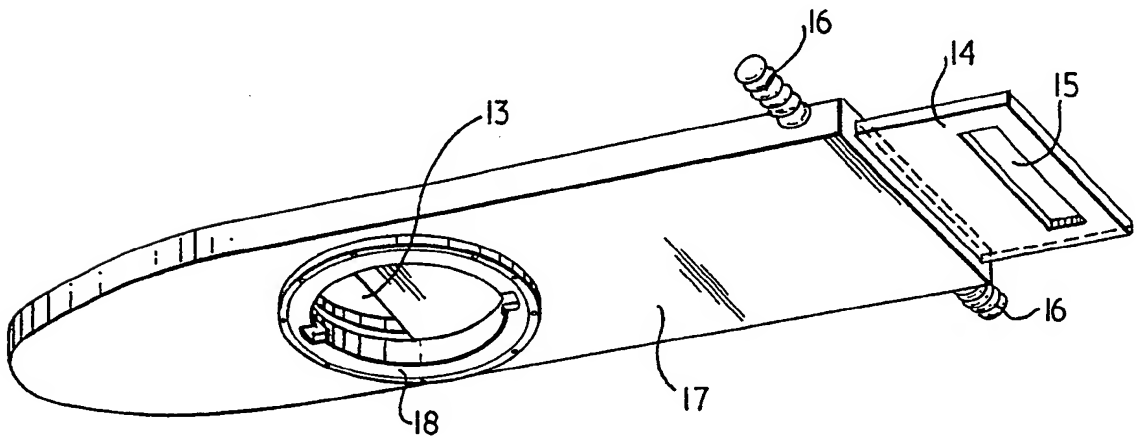


Fig.7

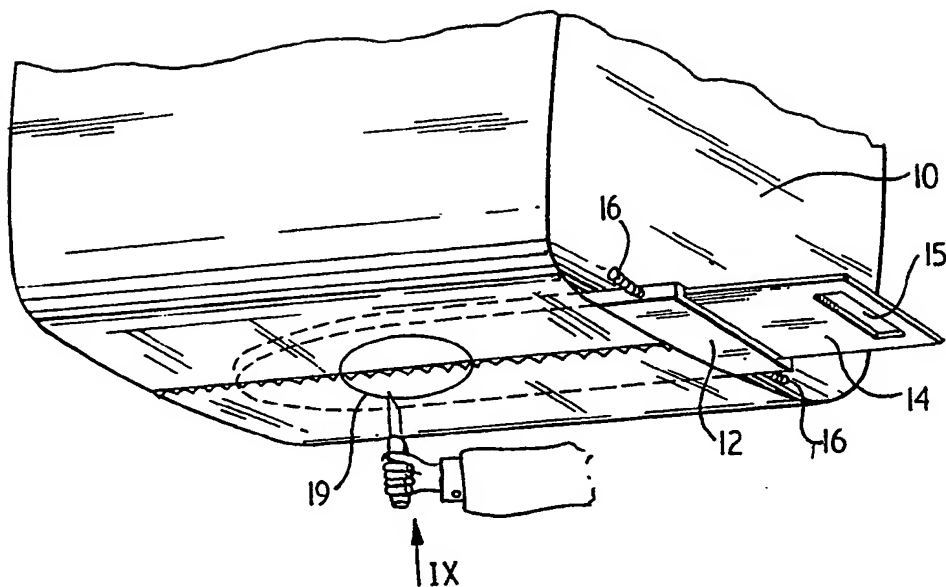


Fig. 8.

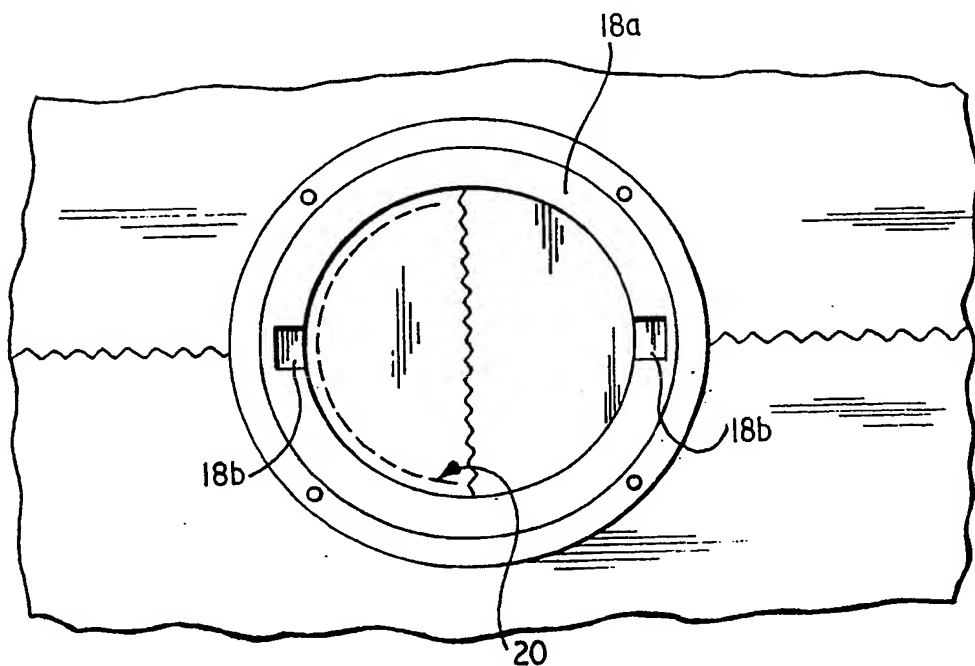


Fig. 9.

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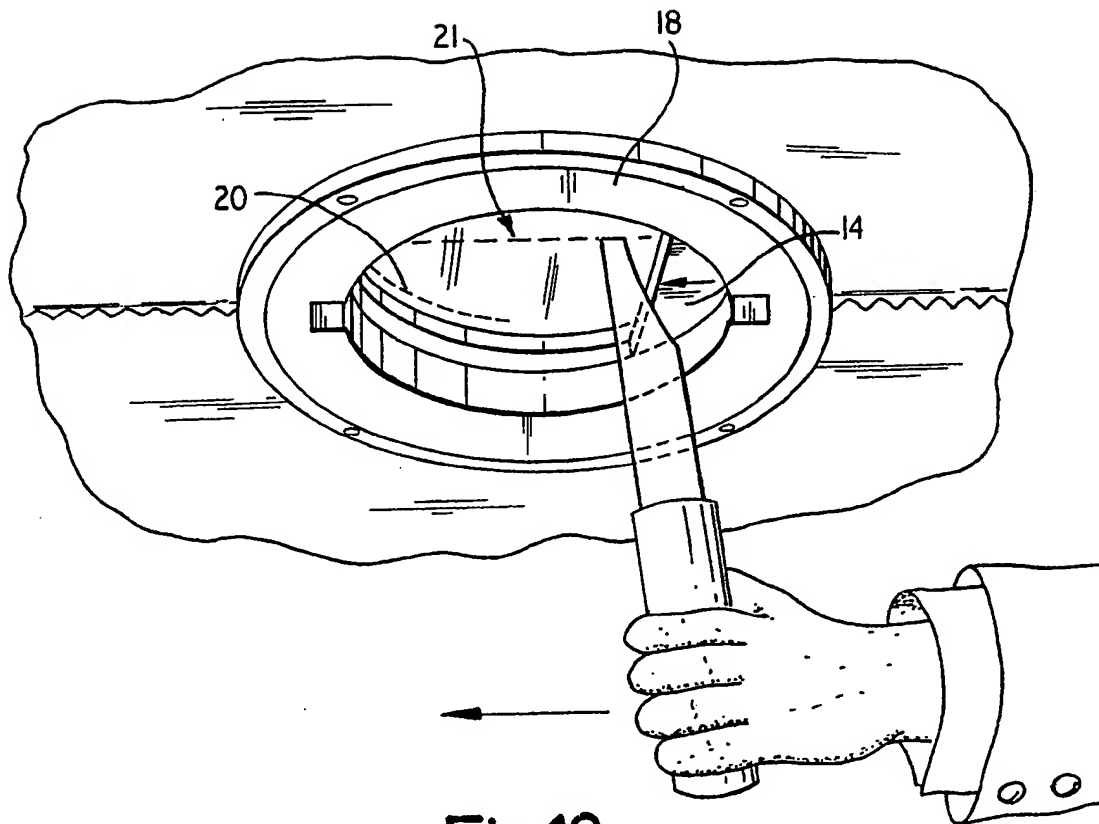


Fig.10.

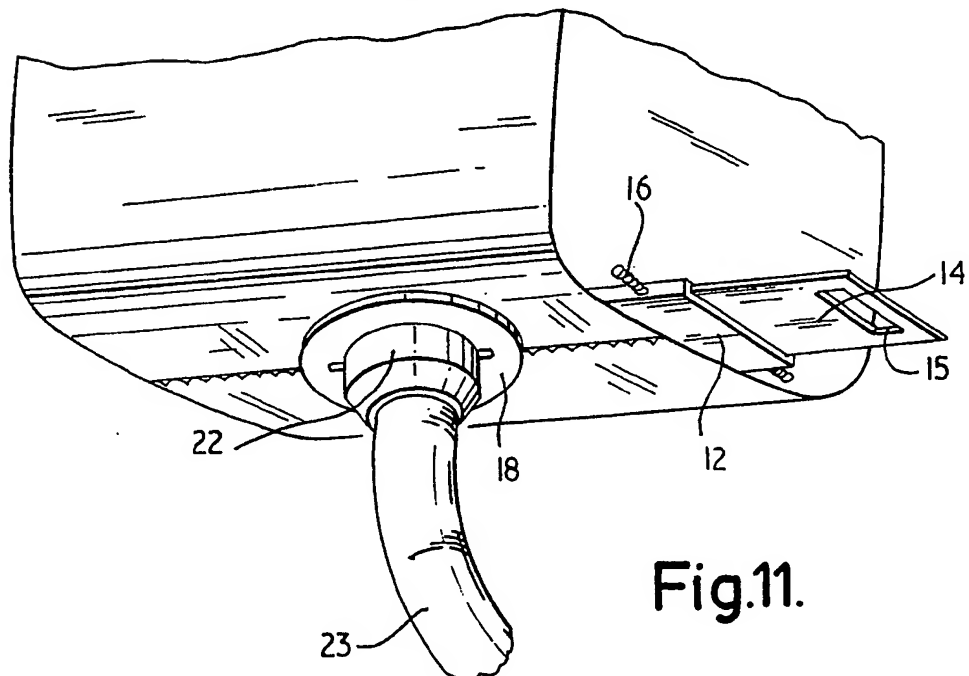


Fig.11.

SPECIFICATION

Flexible Bulk Containers and a Method and Means for Regulating the Discharge of Material Therefrom

5 This invention is concerned with the discharge of fluent material such as powdered or granular material, from flexible bulk containers, and the invention includes a flexible bulk container, a method of controlling the discharge of fluent material from a flexible bulk container, and a discharge control device for use with a flexible bulk container.

Flexible bulk containers are essentially large bags or sacks, generally made of woven plastics material. One well known type of flexible bulk container, is woven from flat polypropylene tape, the weaving taking place without twisting of the tape, so that there are virtually no interstices between the warp and weft yarns in the finished fabric. The bulk containers are fabricated by stitching or by use of other known means, and whilst the detailed design varies from one type of bulk container to another, essentially they all consist of a base, side walls, and lifting means attached to or forming part of the side walls. Such a flexible bulk container may be made from a single piece of woven material, or from a plurality of pieces of woven material secured together.

The lifting means employed, may take the form of webbing or rope material, or it may be constructed from the same material as the body of the container. Such lifting means is intended to be used with mechanical lifting equipment, for example, a crane fitted with a hook, but fork lift trucks or modified agricultural tractors are also widely employed for lifting the containers. Sometimes, these have to be provided with a special hook, or in the case of a fork lift truck, the forks themselves can be used in association with the lifting means on the container.

The capacity of flexible bulk containers varies, but the containers in general use, fall within the range 500 to 2500 kilogrammes weight of contents. The contents themselves, vary from powders, to quite coarse granular material. Prilled urea based fertilizers for agricultural use are a typical load for bulk containers of this kind.

The method whereby the contents of the containers are emptied by the end user varies, according to circumstances, but generally the method is based upon the container itself being supported clear of ground level by the lifting means, and cutting through the base of the container with a sharp knife, or other cutter, the length of the cut being estimated, in order to provide a satisfactory rate of flow of the fluent contents of the container out through the opening formed by the cut. Another method which is sometimes used, is to provide an emptying spout which is sewn into the base of the container, and which is tied off, until discharge of the contents is required. However, this considerably increases the cost of the container itself.

It will be appreciated, that it is necessary for a

65 receiving hopper or other open container to be positioned beneath the container in order to receive the contents when the latter are discharged from the container. Apart from the difficulty of estimating the correct size of opening to provide a satisfactory rate of flow if the slitting method is used, or the high cost of the container if an emptying spout is fitted, these known methods of discharging the contents are likely to give rise to the generation of dust, which in some cases may represent a health risk to the operators.

It is the principle object of the present invention therefore, to provide a method and means, whereby the discharge of the contents of a flexible bulk container, can be satisfactorily regulated.

It has been found, that users of material which is supplied to them in flexible bulk containers frequently require a means whereby the container can be quickly and conveniently connected to a flexible discharge hose, in order to be able to direct the discharge to a convenient position, which may not be immediately beneath the container, or to provide a means of coupling the container to some form of conveyor. A secondary object of the invention therefore, is to provide a means whereby a discharge conduit can conveniently be attached to the container.

Furthermore, it has been found in practice that users of the material supplied to them in flexible bulk containers are often desirous of a means of conveniently starting and stopping the flow of material from the container, so that it is not necessary to discharge the whole contents of the container at a single operation. Frequently, the users would also find it advantageous to have a means of regulating the rate at which the fluent material is discharged from the containers. It is a further object of the present invention therefore, to provide means whereby these desiderata can be achieved.

One form of flexible bulk container with which the present invention is particularly well adapted for use, is described in United Kingdom Patent Specification No: 1475019, and improvements to this flexible bulk container are described in United Kingdom Patent Applications Nos: 7374/78 and 7375/78. The container described in the said United Kingdom Patent and Patent Applications has a special construction, whereby the base or bottom of the container is formed and closed. Whilst the present invention, has been developed with a view to use in connection with flexible bulk containers having base formations as described in the said United Kingdom Patent and pending applications, it may also be used with other designs and constructions of flexible bulk containers.

According to one aspect of the invention, a flexible bulk container is fitted with a discharge control device in the form of an apertured platter having a slidable shutter for closing its aperture, the platter being suspended from the container and lying beneath the base of the container, there

The container is then ready for discharging as and when required. When it is necessary to remove material from the container, it is only necessary to retract the shutter by a desired amount, and this will allow the fluent material to pour out through the aperture 13. If it is required to arrest the discharge of material, this can be achieved simply by pushing the shutter forwardly, to close off the aperture 13. It will also be appreciated, that it is possible to regulate the rate of flow of material from the container 10, by adjusting the position of the shutter 14 with respect to the body of the spade 12.

When the container 10 is completely empty, it is of course possible to remove the spade 12, and use it with another container. Hence, the user need only have a single spade, for each position at his works, where unloading of the material from a container 10 is required.

If it is required to feed the material from the container through a conduit such as the conduit 23, then after the slits have been formed in the base of the container, and whilst the shutter 14 is still in the closed position, the funnel 22 is fitted to the flange 18, and then when the shutter is moved to the open position, the material discharging from the container 10 flows through the conduit 23. In a typical installation, the conduit 23 may be of a length to enable the flow of material to be directed by hand into hoppers or similar equipment.

The dimensions of the spade and its component parts are not critical, but a typical size would be 1.5 metres long, 0.4 metres wide and 12 millimetres thick. The aperture 13 may be in the order of 0.2 metres diameter. With a spade of these typical dimensions, the shutter would be of the order of 0.25 metres wide and 3 millimetres thick. It is envisaged that the spade and its shutter might be fabricated from marine plywood, since this material will facilitate construction, and offers freedom from deterioration due to the weather or exposure to the contents of the flexible containers being emptied. However, it will be appreciated that the spade could be made in plastics material or sheet steel.

Whilst the connection between the funnel 22 and the flange 18 described above, is of the "quick release 1/4 turn" type, it will be appreciated that other releasable connections may be employed. The flange 18 is arranged to project the minimal amount from the lower surface 17 of the spade 12, and if necessary could be recessed into the body of the spade, so as to keep the overall thickness of the spade to a minimum. It will be appreciated, that it is desirable to keep the spade as thin as possible, consistent with it possessing the necessary strength properties, in order that the spade may be slid into the "pocket" between the base and the web of the flexible container.

Claims

1. A flexible bulk container fitted with a discharge control device in the form of an

apertured platter having a slidable shutter for closing its aperture, the platter being suspended from the container and lying beneath the base of the container, there being an outlet in the base of the container registering with the aperture in the platter.

2. A flexible bulk container as claimed in Claim 1, in which the platter is suspended from the container by a web extending under the base of the container from side-to-side thereof and joined to the container base and/or walls only at the sides, so that the platter is received in the open-ended "pocket" between the base and the web.

3. A flexible bulk container as claimed in Claim 1 or Claim 2, in which the outlet in the base of the container is formed by slits which form one or more openable flaps in the base.

4. A method of controlling the discharge of fluent material from a flexible bulk container comprising the steps of: positioning an apertured platter with a slidable shutter for closing the aperture thereof immediately below the base of the container, with the shutter in an open position; forming an outlet in the base of the container by rupturing the base through the aperture to form an outlet opening, and manipulating the shutter to regulate the size of the discharge opening provided by the outlet opening and the aperture.

5. A discharge control device for use with a flexible bulk container comprising a platter formed with a nose at one end to facilitate penetration of the platter into a "pocket" formed in a flexible container, the platter having an aperture and a shutter adapted to slide between a position where it closes the aperture and a position where it opens the aperture.

6. A discharge control device as claimed in Claim 5, in which the shutter is sandwiched between two laminations of the platter, the aperture being formed through both laminations.

7. A discharge control device as claimed in Claim 5 or Claim 6, in which the shutter projects from one end of the platter, and is provided with a hand grip at the projection.

8. A discharge control device as claimed in any one of Claims 5 to 7, in which the platter itself is provided with a pair of hand grips one at each side.

9. A discharge control device as claimed in any one of Claims 5 to 8, in which the platter is provided with attachment means for releasingly attaching a conduit to the platter in a position such that the material discharging from the flexible container through the aperture will flow into the conduit.

10. A discharge control device as claimed in Claim 9, in which the attachment means comprises an annular member secured to the underside of the platter around the aperture and having one or more formations for securing one end of a conduit to it by relative turning movement between the conduit and the annular member.

11. A discharge control device constructed and arranged substantially as herein described with reference to the accompanying drawings.

12. A flexible bulk container as claimed in
5 Claim 1, in which the discharge control device is

in accordance with any one of Claims 5 to 11.

13. A method of controlling the discharge of fluent material from a flexible bulk container, substantially as herein described with reference to
10 the accompanying drawings.

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